

CLAIMS

1. A vacuum heat insulator comprising:
 - a core;
 - 5 a gas-barrier enveloping member covering the core and having a depressurized inside; and
 - 10 a radiation heat transfer suppressor provided on at least one surface among external surfaces of the enveloping member.
- 10 2. The vacuum heat insulator according to claim 1, wherein the radiation heat transfer suppressor is a coating including an infrared ray reflection component.
- 15 3. The vacuum heat insulator according to claim 2, wherein the infrared reflection component is a metal powder.
- 15 4. The vacuum heat insulator according to claim 2, wherein the infrared reflection component is an inorganic powder.
- 20 5. The vacuum heat insulator according to claim 4, wherein the inorganic powder is a metal oxide powder.
- 20 6. The vacuum heat insulator according to claim 2, wherein the coating includes a resin component having a melting point of at least 25 200°C.
- 25 7. The vacuum heat insulator according to claim 1, wherein the radiation heat transfer suppressor includes a fluorocarbon resin.

8. The vacuum heat insulator according to claim 1, wherein the radiation heat transfer suppressor has a first inorganic material film, and a second inorganic material film having a reflectance different from that of the first inorganic material film, and the first inorganic material film and the second inorganic material film are alternately laminated with each other.

9. The vacuum heat insulator according to claim 8, wherein the first inorganic material film and the second inorganic material film are alternately laminated in a thickness of a quarter of a wavelength providing maximum emissivity at a heat-insulating temperature.

10. The vacuum heat insulator according to claim 1, wherein the radiation heat transfer suppressor includes a metal foil.

11. The vacuum heat insulator according to claim 10, wherein the metal foil includes aluminum.

20 12. The vacuum heat insulator according to claim 10, wherein the metal foil includes nickel.

13. The vacuum heat insulator according to claim 1, wherein the radiation heat transfer suppressor includes a resin substrate and a metal film provided on the resin substrate.

25 14. The vacuum heat insulator according to claim 13, wherein the metal film includes aluminum.

15. The vacuum heat insulator according to claim 13, wherein
the metal film includes nickel.

5 16. The vacuum heat insulator according to claim 13, wherein
the resin substrate is a resin film having a melting point of at least
200°C.

10 17. The vacuum heat insulator according to claim 16, wherein
the resin film is a polyphenylene-sulfide film.

18. The vacuum heat insulator according to claim 16, wherein
the resin film is a fluorocarbon resin film.

15 19. The vacuum heat insulator according to claim 1, wherein the
core includes at least a dry silica powder and an electrically
conductive powder.

20 20. The vacuum heat insulator according to claim 19, wherein
the core further includes an inorganic fiber and the core is a mold of a
mixture of the powder and the fiber material.

25 21. The vacuum heat insulator according to claim 1, wherein the
enveloping member is made of a laminate structure having a heat seal
layer, gas-barrier layer, and protective layer, the heat seal layer is
made of a resin having a melting point of at least 200°C, and the
melting points of the gas-barrier layer and the protective layer are
higher than that of the heat seal layer.

22. The vacuum heat insulator according to claim 21, wherein the heat seal layer, gas-barrier layer, and protective layer have flame retardance equal to VTM-2 or higher specified by UL94 standard.

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23. The vacuum heat insulator according to claim 21, wherein the heat seal layer includes a fluorocarbon resin.

24. The vacuum heat insulator according to claim 23, wherein
10 the fluorocarbon resin is polychlorotrifluoroethylene.

25. An apparatus comprising:

a vacuum heat insulator having:

a core; and

15 a gas-barrier enveloping member covering the core and having a depressurized inside;

a heat generation source; and

a radiation heat transfer suppressor provided between the vacuum heat insulator and the heat generation source.

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26. The equipment according to claim 25, wherein a space is provided between the heat generation source and the radiation heat transfer suppressor.

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27. The equipment according to claim 25, wherein the radiation heat transfer suppressor is formed on at least one surface among external surfaces of the enveloping member.

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28. (Added) The vacuum heat insulator according to claim 2,
wherein the infrared ray reflection components include silicon nitrate.

29. (Added) The vacuum heat insulator according to claim 8,
5 wherein combination of the first inorganic material film and the
second inorganic material film is any two selected from magnesium
fluoride, calcium fluoride, lithium fluoride, barium fluoride, thallium
bromo-iodide, thallium bromo-chloride, sodium chloride, potassium
bromide, potassium chloride, silicon oxide, cesium iodide, and zinc
10 selenide.